

## AUTHOR INDEX

- Barnett, J.L., Hemsworth, P.H., Cronin, G.M., Winfield, C.G., McCallum, T.H. and Newman, E.A. (Werribee, Vic., Australia)  
The effects of genotype on physiological and behavioural responses related to the welfare of pregnant pigs ..... 287
- Beaver, B. (College Station, TX, U.S.A.)  
Book review of *Social dynamics, nursing coalitions and infanticide among farm cats, Felis catus* by D.W. Macdonald, P.J. Apps, G.M. Carr and G. Kerby ..... 347
- Beilharz, R.G. (Parkville, Vic., Australia)  
Science and the politics of animal use in food production. The situation in Australia ..... 143
- Blokhuys, H.J., *see* Coenen, A.M.L. et al.
- Boissy, A. and Bouissou, M.F. (Monnaie, France)  
Effects of early handling on heifers' subsequent reactivity to humans and to unfamiliar situations ..... 259
- Bölter, U., *see* Fölsch, D.W. et al.
- Bouissou, M.F., *see* Boissy, A. and Bouissou, M.F.
- Bradley, N.W., *see* Dougherty, C.T. et al.
- Broom, D.M. (Cambridge, Gt. Britain)  
The scientific assessment of animal welfare ..... 5
- Church, R.B. (Calgary, Alberta, Canada)  
Are problems posed by genetically engineered animals? ..... 73
- Coenen, A.M.L., van Luijckelaar, E.L.J.M. (Nijmegen, The Netherlands), Wolters, E.M.T.J. (Wageningen, The Netherlands) and Blokhuys, H.J. (Beekbergen, The Netherlands)  
Effects of intermittent lighting on sleep and activity in the domestic hen ..... 309
- Cornelius, P.L. *see* Dougherty, C.T. et al.
- Craig, J.V., Okpokho, N.A. and Milliken, G.A. (Manhattan, KS, U.S.A.)  
Floor and cage-rearing effects on pullets' initial adaptation to multiple-hen cages ..... 319
- Cronin, G.M., *see* Barnett, J.L. et al.
- Curtis, S.E. (Urbana, IL, U.S.A.)  
Animals in food production — American issues ..... 151
- Dawkins, M.S. (Oxford, Gt. Britain)  
Behavioural deprivation: a central problem in animal welfare ..... 209
- Dellmeier, G.R., *see* Friend, T.H. and Dellmeier, G.R.
- Dougherty, C.T., Bradley, N.W., Cornelius, P.L. and Lauriault, L.M. (Lexington, KY, U.S.A.)  
Expression of the regulation of energy balance on the ingestive behavior of grazing beef cattle supplemented by grain ..... 227
- Ekesbo, I. (Skara, Sweden)  
Animal health implications as a result of future livestock and husbandry developments ... 95
- Fölsch, D.W., Huber, H.U., Bölter, U. and Gozzoli, L. (Zürich, Switzerland)  
Reserach on alternatives to the battery system for laying hens ..... 29
- Fox, M.W. (Washington, DC, U.S.A.)  
Genetic engineering biotechnology: animal welfare and environmental concerns ..... 83
- Fraser, A.F. (St. John's, Newfoundland, Canada)  
Animal suffering: the appraisal and control of depression and distress in livestock ..... 127  
Panel discussions: common practices, common problems ..... 175
- Friend, T.H. and Dellmeier, G.R. (College Station, TX, U.S.A.)  
Common practices and problems related to artificially rearing calves: an ethological analysis ..... 47

Gozzoli, L., <i>see</i> Fölsch, D.W. et al.	
Hammell, K.L., Metz, J.H.M. and Mekking, P. (Wageningen, The Netherlands)	
Sucking behaviour of dairy calves fed milk ad libitum by bucket or teat .....	275
Harrison, R.	
Special address, Bio-Ethics Symposium .....	21
Hemsworth, P.H., <i>see</i> Barnett, J.L. et al.	
Houpt, K.A., <i>see</i> Olm, D.D. and Houpt, K.A.	
Huber, H.U., <i>see</i> Fölsch, D.W. et al.	
Hughes, T.	
Opening address, Bio-Ethics Symposium .....	1
Hulsegge, B., <i>see</i> Lambooy, E. and Hulsegge, B.	
Hurnik, J.F. (Guelph, Ont., Canada)	
Welfare of farm animals .....	105
Jackson, W.T. (Eastbourne, Gt. Britain)	
On-farm animal welfare law in Europe — using the law .....	165
Jensen, P. (Skara, Sweden)	
Maternal behaviour and mother-young interactions during lactation in free-ranging domestic pigs .....	297
Jensen, P., <i>see</i> Lidfors, L. and Jensen, P.	
Lambooy, E. and Hulsegge, B. (Zeist, The Netherlands)	
Long-distance transport of pregnant heifers by truck .....	249
Lauriault, L.M., <i>see</i> Dougherty, C.T. et al.	
Lidfors, L. and Jensen, P. (Skara, Sweden)	
Behaviour of free-ranging beef cows and calves .....	237
Loew, F.M. (Boston, MA, U.S.A.)	
Closing remarks, Bio-Ethics Symposium .....	201
Panel discussions: science and the politics of the use of animals in food production .....	195
McCallum, T.H., <i>see</i> Barnett, J.L. et al.	
Mekking, P., <i>see</i> Hammell, K.L. et al.	
Metz, J.H.M., <i>see</i> Hammell, K.L. et al.	
Milliken, G.A., <i>see</i> Craig, J.V. et al.	
Newman, E.A., <i>see</i> Barnett, J.L. et al.	
Okpokho, N.A., <i>see</i> Craig, J.V. et al.	
Olm, D.D. and Houpt, K.A. (New York, NY, U.S.A.)	
Feline house-soiling problems .....	335
Rowan, A.N. (Boston, MA, U.S.A.)	
Animal anxiety and animal suffering .....	135
Rowell, H. (Ottawa, Ont., Canada)	
Panel discussions: animal suffering .....	190
Tennessen, T. (Truro, Nova Scotia, Canada)	
Improving the life of farm livestock: a Canadian point of view .....	159
Van, Luijelaar, E.L.J.M., <i>see</i> Coenen, A.M.L. et al.	
Van Putten, G. (Zeist, The Netherlands)	
Farming beyond the ability for pigs to adapt .....	63
Williams, C.M. (Saskatoon, Sask., Canada)	
Panel discussions: future factors and biotechnology applications in animal husbandry .....	183
Winfield, C.G., <i>see</i> Barnett, J.L. et al.	
Wolters, E.M.T.J., <i>see</i> Coenen, A.M.L. et al.	
Yousef, M.K. (Las Vegas, NV, U.S.A.)	
Animal stress and strain: definition and measurements .....	119

## SUBJECT INDEX

Activity	
Effects of intermittent lighting on sleep and activity in the domestic hen .....	309
Adaptation	
Farming beyond the ability for pigs to adapt .....	63
Floor- and cage-rearing effects on pullets' initial adaptation to multiple-hen cages .....	319
Animal health	
Animal health implications as a result of future livestock and husbandry developments ...	95
Animal rights	
The scientific assessment of animal welfare .....	5
Anxiety	
Animal anxiety and animal suffering .....	135
Assessment	
The scientific assessment of animal welfare .....	5
Animal stress and strain: definition and measurements .....	119
Animal suffering: the appraisal and control of depression and distress in livestock .....	127
Australia	
Science and the politics of animal use in food production. The situation in Australia .....	143
Battery systems	
Research on alternatives to the battery system .....	29
Beef cattle	
Expression of the regulation of energy balance on the ingestive behaviour of grazing beef cattle supplemented by grain .....	227
Behaviour of free-ranging beef cows and calves .....	237
Behaviour	
Common practices and problems related to artificially rearing calves: an ethological analysis .....	47
Farming beyond the ability for pigs to adapt .....	63
Animal suffering: the appraisal and control of depression and distress in livestock .....	127
Behavioural deprivation: a central problem in animal welfare .....	209
Behaviour of free-ranging beef cows and calves .....	237
The effects of genotype on physiological and behavioural responses related to the welfare of pregnant pigs .....	287
Maternal behaviour and mother-young interactions during lactation in free-ranging domestic pigs .....	297
Floor- and cage-rearing effects on pullets' initial adaption to multiple-hen cages .....	319
Feline house-soiling problems .....	335
Bio-Ethics	
The scientific assessment of animal welfare .....	5
Special address .....	21
Research on alternatives to the battery system .....	29
Common practices and problems related to artificially rearing calves: and ethological analysis .....	47
Farming beyond the ability for pigs to adapt .....	63
Are problems posed by genetically engineered animals? .....	73
Genetic engineering biotechnology: animal welfare and environmental concerns .....	83
Animal health implications as a result of future livestock and husbandry developments ...	95
Welfare of farm animals .....	105
Animal stress and strain: definition and measurements .....	119



Animal suffering: the appraisal and control of depression and distress in livestock .....	127
Animal anxiety and animal suffering .....	135
Science and the politics of animal use in food production. The situation in Australia .....	143
Animals in food production — American issues .....	151
Improving the life of farm livestock: a Canadian point of view .....	159
On-farm animal welfare law in Europe — using the law .....	165
Common practices, common problems .....	175
<b>Biology</b>	
Science and the politics of animal use in food production. The situation in Australia .....	143
<b>Biotechnology</b>	
Are problems posed by genetically engineered animals? .....	73
Genetic engineering biotechnology: animal welfare and environmental concerns .....	83
Future factors and biotechnology applications in animal husbandry .....	183
<b>Bovine ethogram</b>	
Common practices and problems related to artificially rearing calves: an ethological analysis .....	47
<b>Breeding programmes</b>	
Animal health implications as a result of future livestock and husbandry developments ...	95
<b>Bucket</b>	
Sucking behaviour of dairy calves fed milk ad libitum by bucket or teat .....	275
<b>Cages</b>	
Floor- and cage-rearing effects on pullets' initial adaptation to multiple-hen cages .....	319
<b>Calves</b>	
Common practices and problems related to artificially rearing calves: an ethological analysis .....	47
Behaviour of free-ranging beef cows and calves .....	237
Sucking behaviour of dairy calves fed milk ad libitum by bucket or teat .....	275
<b>Canada</b>	
Improving the life of farm livestock: a Canadian point of view .....	159
<b>Cats</b>	
Feline house-soiling problems .....	335
Social dynamics, nursing coalitions and infanticide among farm cats, <i>Felis catus</i> (book review) .....	347
<b>Cattle</b>	
Expression of the regulation of energy balance on the ingestive behaviour of grazing beef cattle supplemented by grain .....	227
Behaviour of free-ranging beef cows and calves .....	237
Long-distance transport of pregnant heifers by truck .....	249
Effects of early handling on heifers' subsequent reactivity to humans and to unfamiliar situations .....	259
Sucking behaviour of dairy calves fed milk ab libitum by Bucket or teat .....	275
<b>Cows</b>	
Behaviour of free-ranging beef cows and calves .....	237
<b>Dairy calves</b>	
Sucking behaviour of dairy calves fed milk ad libitum by bucket or teat .....	275
<b>Depression</b>	
Animal suffering: the appraisal and control of depression and distress in livestock .....	127
<b>Deprivation</b>	
Behavioural deprivation: a central problem in animal welfare .....	209
<b>Economics</b>	
Research on alternatives to the battery system .....	29

Animals in food production — American issues .....	149
Embryo manipulation	
Are problems posed by genetically engineered animals? .....	73
Energy balance	
Expression of the regulation of energy balance on the ingestive behaviour of grazing beef cattle supplemented by grain .....	227
England	
On-farm animal welfare law in Europe — using the law .....	165
Environment	
Genetic engineering biotechnology: animal welfare and environmental concerns .....	83
Ethics	
Special address .....	21
Europe	
On-farm animal welfare law in Europe — using the law .....	165
Evolution	
Science and the politics of animal use in food production. The situation in Australia .....	143
Farm livestock	
Welfare of farm animals .....	105
Improving the life of farm livestock: a Canadian Point of view .....	159
On-farm animal welfare law in Europe — using the law .....	165
Fearfulness	
Effects of early handling on heifers' subsequent reactivity to humans and to unfamiliar situations .....	259
Floor pens	
Floor- and cage-rearing effects on pullets' initial adaptation to multiple-hen cages .....	319
Food production	
Science and the politics of animal use in food production. The situation in Australia .....	143
Animals in food production — American issues .....	151
Free-range systems	
Research on alternatives to the battery system .....	29
Maternal behaviour and mother-young interactions during lactation in free-ranging domestic pigs .....	297
<i>Gallus domesticus</i>	
Effects of intermittent lighting on sleep and activity in the domestic hen .....	309
Genetic engineering	
Are problems posed by genetically engineered animals? .....	73
Genetic engineering biotechnology: animal welfare and environmental concerns .....	83
Genotype	
The effects of genotype on physiological and behavioural responses related to the welfare of pregnant pigs .....	287
Grain	
Expression of the regulation of energy balance on the ingestive behaviour of grazing beef cattle supplemented by grain .....	227
Handling	
Effects of early handling on heifers' subsequent reactivity to humans and to unfamiliar situations .....	259
Heifers	
Long-distance transport of pregnant heifers by truck .....	249
Effects of early handling on heifers' subsequent reactivity to humans and to unfamiliar situations .....	259

House-soiling	
Feline house-soiling problems .....	335
Humans	
Effects of early handling on heifers' subsequent reactivity to humans and to unfamiliar situations .....	259
Husbandry	
Animal health implications as a result of future livestock and husbandry developments ...	95
Ingestive behaviour	
Expression of the regulation of energy balance on the ingestive behaviour of grazing beef cattle supplemented by grain .....	227
Lactation	
Maternal behaviour and mother-young interactions during lactation in free-ranging domestic pigs .....	297
Law	
On-farm animal welfare law in Europe — using the law .....	165
Legislation	
Special address .....	21
Welfare of farm animals .....	103
Lighting	
Effect of intermittent lighting on sleep and activity in the domestic hen .....	309
Maternal behaviour	
Maternal behaviour and mother-young interactions during lactation in free-ranging domestic pigs .....	297
Milk	
Sucking behaviour of dairy calves fed milk ab libitum by bucket or teat .....	275
Mother-young interactions	
Maternal behaviour and mother-young interactions during lactation in free-ranging domestic pigs .....	297
Multiple-hen cages	
Floor- and cage-rearing effects on pullets' initial adaptation to multiple-hen cages .....	319
Pigs	
Farming beyond the ability for pigs to adapt .....	63
The effects of genotype on physiological and behavioural responses related to the welfare of pregnant pigs .....	287
Maternal behaviour and mother-young interactions during lactation in free-ranging domestic pigs .....	297
Politics	
Science and the politics of animal use in food production. The situation in Australia .....	143
Science and the politics of the use of animals in food production .....	195
Poultry	
Research on alternatives to the battery system .....	29
Effects of intermittent lighting on sleep and activity in the domestic hen .....	309
Floor- and cage-rearing effects on pullets' initial adaption to multiple-hen cages .....	319
Practices	
Common practices, common problems .....	175
Pregnant heifers	
Long-distance transport of pregnant heifers by truck .....	249
Pregnant pigs	
The effects of genotype on physiological and behavioural responses related to the welfare of pregnant pigs .....	287



Problems	
Common practices, common problems .....	175
Reproduction	
Are problems posed by genetically engineered animals? .....	73
Sentience	
Animal anxiety and animal suffering .....	135
Sleep	
Effects of intermittent lighting on sleep and activity in the domestic hen .....	309
Stress	
Common practices and problems related to artificially rearing calves: an ethological analysis .....	47
Animal stress and strain: definition and measurements .....	119
The effects of genotype on physiological and behavioural responses related to the welfare of pregnant pigs .....	287
Sucking behaviour	
Sucking behaviour of dairy calves fed milk ad libitum by bucket or teat .....	275
Suckling	
Behaviour of free-ranging beef cows and calves .....	237
Suffering	
Animal suffering: the appraisal and control of depression and distress in livestock .....	127
Animal anxiety and animal suffering .....	135
Animal suffering .....	190
Behavioural deprivation: a central problem in animal welfare .....	209
Survival	
Farming beyond the ability for pigs to adapt .....	63
Animal stress and strain: definition and measurements .....	119
Teat	
Sucking behaviour of dairy calves fed milk ad libitum by bucket or teat .....	275
Time-budgets	
Behavioural deprivation: a central problem in animal welfare .....	209
Transportation	
Long-distance transport of pregnant heifers by truck .....	249
U.S.A.	
Animals in food production — American issues .....	151
Welfare	
The scientific assessment of animal welfare .....	5
Genetic engineering biotechnology: animal welfare and environmental concerns .....	83
Welfare of farm animals .....	105
Animal suffering: the appraisal and control of depression and distress in livestock .....	127
Science and the politics of animal use in food production. The situation in Australia .....	143
Animals in food production — American issues .....	151
Improving the life of farm livestock: a Canadian point of view .....	159
On-farm animal welfare law in Europe — using the law .....	165
Behavioural deprivation: a central problem in animal welfare .....	209
The effects of genotype on physiological and behavioural responses related to the welfare of pregnant pigs .....	287
Welfare codes	
Special address .....	21

